



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

52

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
| 09/919,149 | 07/31/2001 | N. Lee Rhodes | 10013112-1 | 3173 |

22879 7590 03/18/2005

HEWLETT PACKARD COMPANY
P O BOX 272400, 3404 E. HARMONY ROAD
INTELLECTUAL PROPERTY ADMINISTRATION
FORT COLLINS, CO 80527-2400

| |
|----------|
| EXAMINER |
|----------|

CHEA, PHILIP J

| | |
|----------|--------------|
| ART UNIT | PAPER NUMBER |
|----------|--------------|

2153

DATE MAILED: 03/18/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/919,149

Applicant(s)

RHODES, N. LEE

Examiner

Philip J Chea

Art Unit

2153

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 31 January 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-22 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-22 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

Art Unit: 2153

DETAILED ACTION

This action is in response to an Amendment filed January 1, 2005. Claims 1-22 are presented for further consideration of which claims 21-22 are new.

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 2, 3 and 5 rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 2 recites the limitation "the incoming data" in line 3. There is insufficient antecedent basis for this limitation in the claim.

Claim 3 rejected by virtue of being dependent on a rejected claim.

Regarding claim 5, the phrase "high data rate" renders the claim indefinite because it is unclear what limitation(s) are included.

The amended claims have overcome these rejections.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Art Unit: 2153

4. Claims 1,2,4-8,16-18,20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Friedrich et al. (US 5,958,009), and further in view of Marshall et al. ("Statistics of Mixed Data Traffic on a Local Area Network").

As per claims 1, 16, and 20, although the system disclosed by Friedrich et al. shows a system for analyzing a stream of data comprising:

- receiving the stream of data (see column 8, lines 25-36, where the data is collected by the sensors);
- determining a data distribution representative of the stream of data including creating bins (see column 8, lines 37-48, where the analyzer computes the distributional characteristics of the collected data and computes histograms implying creating bins);
- allocating statistical representation of the data in the data bins (see column 8, lines 37-48, where the analyzer computes histograms implying that the statistical data calculated was placed in the histogram); and
- using the data distribution to analyze the stream of data (see column 8, lines 53-57, where presenting for visualization is considered to analyze the stream of data),

it fails to disclose creating data bins having exponentially increasing sizes.

Nonetheless, these features are well known in the art and would have been an obvious modification of the system disclosed by Friedrich et al., as evidenced by Marshall et al.

In an analogous art, Marshall et al. disclose analyzing a network using histograms to represent the distribution of the data transmission (see Abstract). Further disclosing creating data bins having exponentially increasing sizes (see 186, right-hand column, paragraph 2, and Figs. 4,6,7, where Figs. show different data distributions from different tests run on the network, all employing log scales implying exponentially increasing sizes).

Given the teaching of Marshall et al., a person having ordinary skill in the art would have readily recognized the desirability and advantages of modifying Friedrich et al. by employing exponentially increasing bin sizes, such as disclosed by Marshall et al., in order to represent large amounts of data in a distribution which is easiest to interpret.

Art Unit: 2153

As per claims 2 and 17, Friedrich et al. in view of Marshall et al. further disclose indexing the bins using a set of keys determined from a function of the logarithm of the data, determining a set of exponentially increasing intervals to define the data bin sizes (although not expressly stated, the log scale used to create the histogram taught by Marshall et al. implies (if not inherent) the use of indexing from a function of the logarithm of data and determining a set of exponentially increasing intervals to define the data bin sizes).

As per claim 4, Friedrich et al. in view of Marshall et al. further disclose querying a data source and collecting the stream of data from the data source in response to the query (see Friedrich et al. column 8, lines 25-36, where querying a data source is considered collecting data through sensors located among the network).

As per claim 5, Friedrich et al. in view of Marshall et al. further disclose defining the data stream as a continuous stream having a data rate of at least 10,000 records/second (see Marshall et al. Fig. 1, where the data stream being analyzed includes networks capable of 17 Mb/s and 56 kb/s).

As per claim 6, Friedrich et al. in view of Marshall et al. further disclose defining the stream of data as having only positive values (see Marshall et al. Fig. 5, where a graph of the packets coming in are all positive values).

As per claim 7, Friedrich et al. in view of Marshall et al. further disclose defining the data stream as having an unknown lowest value and an unknown upper value (see Friedrich et al. column 10, lines 13-27, where raw data being probed implies receiving the streaming data as is without knowing what is the lowest value or upper value).

As per claim 8, Friedrich et al. in view of Marshall et al. further disclose defining a bin order and storing the bin order in memory (see Friedrich et al. column 8, lines 37-48, where a bin order and memory is implied if a histogram is being computed).

As per claim 18, Friedrich et al. in view of Marshall et al. further disclose the data being usage data (see Friedrich et al. columns 4 and 5, lines 53-67 and 1-7).

Art Unit: 2153

5. Claims 9,19,21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Friedrich et al. in view of Marshall et al. as applied to claims 8 and 16 above, and further in view of Official Notice.

As per claim 9, although Friedrich et al. in view of Marshall et al. show substantial features of the claimed invention (discussed above), it fails to disclose storing the data bins in an array structure in memory. Nonetheless, storing data in an array structure is well known in the art and would have been an obvious modification of the system disclosed by Friedrich et al. in view of Marshall et al. due to official notice.

A person having ordinary skill in the art would have readily recognized the desirability and advantages of modifying Friedrich et al. in view of Marshall et al. by storing the data bins in an array structure in memory, in order to allow a simple method of storage providing $O(n)$ sequential searching ability.

As per claim 19, although Friedrich et al. in view of Marshall et al. show substantial features of the claimed invention (discussed above), it fails to disclose ordering the data bins in an array structure. Nonetheless, placing data in an array structure to order them is well known in the art and would have been an obvious modification of the system disclosed by Friedrich et al. in view of Marshall et al. due to official notice.

A person having ordinary skill in the art would have readily recognized the desirability and advantages of modifying Friedrich et al. in view of Marshall et al. by storing the data bins in an array structure in memory, in order to allow a simple method of storage providing $O(n)$ sequential searching ability.

As per claim 21, although the system disclosed by Friedrich et al. in view of Marshall et al. shows substantial features of the claimed invention (discussed above in claims 1 and 2), it fails to disclose defining a bin order as an array structure; and storing the bin order in memory.

Nonetheless, these features are well known in the art and would have been an obvious modification of the system disclosed by Friedrich et al. in view of Marshall et al., as evidenced by Official Notice.

Art Unit: 2153

A person having ordinary skill in the art would have readily recognized the desirability and advantages of modifying Friedrich et al. in view of Marshall et al. by storing the data bins in an array structure in memory, in order to allow a simple method of storage providing $O(n)$ sequential searching ability.

6. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Friedrich et al. in view of Marshall et al. as applied to claims 1 and 16 above, and further in view of Wright ("A Simple Hash Table Implementation").

Friedrich et al. in view of Marshall et al. fails to disclose, as claimed, wherein determining the set of keys includes:

- defining a resolution factor as a number of data bins desired per power of the chosen logarithm base; and
- using the resolution factor to determine the set of exponentially increasing intervals.

Although the system disclosed by Friedrich et al. in view of Marshall et al. shows substantial features of the claimed invention (discussed above), it fails to disclose defining a resolution factor and using the resolution factor to determine the set of increasing intervals.

Nonetheless, these features are well known in the art and would have been an obvious modification of the system disclosed by Friedrich et al. in view of Marshall et al., as evidenced by Wright.

In an analogous art, Wright discloses a means for indexing an item in a data structure using a key determined from a logarithmic function (see Wright page 2, line 2 of code). Further, implying that the resolution factor is already known, which determines the set of intervals.

Given the teaching of Wright, a person having ordinary skill in the art would have readily recognized the desirability and advantages of modifying Friedrich et al. in view of Marshall et al. by employing a means of defining a resolution factor as a number of data bins, and using the resolution factor to determine the set of exponentially increasing intervals, in order to adjust the number of data bins according to the desired statistical testing parameters.

Art Unit: 2153

7. Claims 10-15,22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Friedrich et al. in view of Marshall et al. in view of Official Notice as applied to claim 9 above, and further in view of Wright.

As per claim 10, although the system disclosed by Friedrich et al. in view of Marshall et al. shows substantial features of the claimed invention (discussed above), it fails to disclose computing a bin key associated with a data value, defining an array index having an array of index values wherein each array index value is associated with a data bin; and determining the data bin using the array index and bin key.

Nonetheless, these features are well known in the art and would have been an obvious modification of the system disclosed by Friedrich et al. in view of Marshall et al., as evidenced by Wright.

In an analogous art, Wright discloses a means for indexing an item in a data structure using a key determined from a logarithmic function (see Wright page 2, line 2 of code).

Given the teaching of Wright, a person having ordinary skill in the art would have readily recognized the desirability and advantages of modifying Friedrich et al. in view of Marshall et al. by employing a key hashing means, such as disclosed by Wright, in order to quickly access an element in a large portion of data (see Wright page 2, 3rd paragraph below code).

In considering defining an array index and determining the data bin associated with the data value, as discussed previously storing data in an array is well known in the art and would have been an obvious modification of the system disclosed by Friedrich et al. in view of Marshall et al.

A person having ordinary skill in the art would have readily recognized the desirability and advantages of modifying Friedrich et al. in view of Marshall et al. by storing the data bins in an array structure, in order to allow a simple method of storage providing $O(n)$ sequential searching ability.

As per claim 11, Friedrich et al. in view of Marshall et al. in view of Wright disclose updating the value stored in the data bin (see Marshall et al., Figs. 4,6,7, where data is seen distributed among the bins implying that the data was being updated during the sampling time).

As per claim 12, Friedrich et al. in view of Marshall et al. does not expressly disclose wherein if a data bin cannot be determined, extending the array structure to accommodate the data value.

Art Unit: 2153

Nonetheless, extending the array structure by utilizing a dynamic array is well known in the art and would have been an obvious modification of the system disclosed by Friedrich et al. in view of Marshall et al.

A person having ordinary skill in the art would have readily recognized the desirability and advantages of modifying Friedrich et al. in view of Marshall et al. by using a dynamic array structure, in order to accommodate an unknown amount of data, while still providing an $O(n)$ sequential searching ability.

As per claim 13, although the system disclosed by Friedrich et al. in view of Marshall et al. show substantial features of the claimed invention (discussed above), it fails to disclose indexing the bins using a set of keys.

Nonetheless, these features are well known in the art and would have been an obvious modification of the system disclosed by Friedrich et al. in view of Marshall et al., as evidenced by Wright.

In an analogous art, Wright discloses a means for indexing an item in a data structure using a key (see Wright page 2, 2nd paragraph below code, where a search key is used to go straight to an element of an array).

Given the teaching of Wright, a person having ordinary skill in the art would have readily recognized the desirability and advantages of modifying Friedrich et al. in view of Marshall et al. by employing a key hashing means, such as disclosed by Wright, in order to quickly access an element in a large portion of data (see Wright page 2, 3rd paragraph below code).

As per claim 14 and 15, although the system disclosed by Friedrich et al. in view of Marshall et al. show substantial features of the claimed invention (discussed above), it fails to disclose defining the array structure as a tree array structure.

Nonetheless, these features are well known in the art and would have been an obvious modification of the system disclosed by Friedrich et al. in view of Marshall et al., as evidenced by Wright.

In an analogous art, Wright discloses a means for indexing an item in a data structure using a key (see Wright page 3, 2nd paragraph below code, where a search key is used to go straight to an element of an array). Wright further discloses using a binary tree to store the data instead of an array.

Art Unit: 2153

Given the teaching of Wright, a person having ordinary skill in the art would have readily recognized the desirability and advantages of modifying Friedrich et al. in view of Marshall et al. by employing a tree structure to store data, such as disclosed by Wright, in order to quickly access an element in a large portion of data where the amount of data is not known (see Wright page 2, 4th paragraph below code).

In considering claim 15, Friedrich et al. in view of Marshall et al. in view of Wright further disclose creating a data bin if a data bin does not exist (see Wright page 2, 4th paragraph below code, where it is implied that a data bin can be created in the tree because Wright discloses that a tree structure is beneficial if the amount of data is not known implying that the tree is dynamic).

8. As per claim 22, although the system disclosed by Friedrich et al. in view of Marshall et al. in view of Official Notice shows substantial features of the claimed invention (discussed above), it fails to disclose defining the array structure as a tree array structure, wherein allocating a data value in the tree array structure includes determining a data bin for the data value, and if a data bin does not exist, creating a data bin.

Nonetheless, these features are well known in the art and would have been an obvious modification of the system disclosed by Friedrich et al. in view of Marshall et al. in view of Official Notice, as evidenced by Wright.

In an analogous art, Wright discloses a means for indexing an item in a data structure using a key (see Wright page 3, 2nd paragraph below code, where a search key is used to go straight to an element of an array). Wright further discloses using a binary tree to store the data instead of an array.

Given the teaching of Wright, a person having ordinary skill in the art would have readily recognized the desirability and advantages of modifying Friedrich et al. in view of Marshall et al. by employing a tree structure to store data, such as disclosed by Wright, in order to quickly access an element in a large portion of data where the amount of data is not known (see Wright page 2, 4th paragraph below code).

Art Unit: 2153

In considering creating a data bin if a data bin does not exist (see Wright page 2, 4th paragraph below code, where it is implied that a data bin can be created in the tree because Wright discloses that a tree structure is beneficial if the amount of data is not known implying that the tree is dynamic).

Response to Arguments

1. See above for response to Amendments in reference to 112 rejections.
2. Applicant's arguments with respect to claim 1,4-8,16,18, and 20, have been considered but are moot in view of the new ground(s) of rejection.
 - (I) Applicant contends that Claffy fails to disclose determining a data distribution representative of the stream of data, including creating data bins having exponentially increasing sizes; allocating statistical representation of the data in the data bins; and using the data distribution to analyze the stream of data.
 - In considering (I), the amended claims have overcome the basis of rejection presented with Claffy. However, new grounds of rejection provided by Friedrich et al. in view of Marshall et al. shows the missing limitations described above (see grounds for new rejection above).
3. Applicant's arguments with respect to claims 17 have been considered but are moot in view of the new ground(s) of rejection.
 - (II) Applicant contends that Wright relates to a simple has table implementation, while the current application relates to real-time analyzing of a stream of data and that hash table implementations are not related to the current invention.
 - (III) Applicant contends that the Wright reference teaches away from the current invention.
 - In considering (II), Wright is no longer being used as a reference in teaching the limitations of claim 17.
 - In considering (III), Wright is no longer being used as a reference in teaching the limitations of claim 17.

Art Unit: 2153

Conclusion


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Philip J Chea whose telephone number is 571-272-3951. The examiner can normally be reached on M-F 7:00-4:30 (1st Friday Off).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenn Burgess can be reached on 571-272-3949. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Philip J Chea
Examiner
Art Unit 2153

PJC 3/10/05


GLENN B. BURGESS
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2100